What is claimed is:

1. A generator with plural power-generation characteristics, comprising a rotor shaft supported for rotation in a stator frame, a rotor mounted against rotation on the rotor shaft, and a stator arranged around the rotor and fixed to the stator frame, wherein the stator is comprised of an inside cylinder arranged around the rotor to define an air gap between confronting surfaces of them, teeth arranged spaced circumferentially on the inside cylinder to form sequential slots, an outside cylinder surrounding around tooth tips of the teeth, more than one systems of stator windings either concentrated-wound or shunt-wound with a preselected slot span, one of which is low power windings each containing a small number of turns while another of which is high power windings each containing a large number of turns, and terminal lines having terminals connected to any preselected low power and high power windings.

2. A generator constructed as defined in claim 1, wherein the stator has a stator core including a circular toothed member and a cylindrical magnetic path, the circular toothed member being composed of the inside cylinder and the teeth that are integral with the inside cylinder and extend radially outwardly to

form the slots opened radially outwardly, and the cylindrical magnetic path being prepared separately from the toothed member and fit over the toothed member.

3. A generator constructed as defined in claim 2, wherein the cylindrical magnetic path is closely press-fit over sequential tooth tips of the teeth of the toothed member, together with a cylinder of soft material superior in magnetic permeability.

4. A generator constructed as defined in claim 2, wherein a resinous material is poured on the stator then, followed by solidified to hold in place the stator windings laid in the slots between any two adjacent teeth of the toothed member.

5. A generator constructed as defined in claim 4, wherein the stator windings are led through radially outward slot openings of the slots between the adjacent teeth of the toothed member and wound spanning some slots, while the cylindrical magnetic path fits over the toothed member in which the windings laid in the slots have been held in place with the resinous material.

6. A generator constructed as defined in claim 4, wherein the resinous material is made of any heat-stable material hard to be fused owing to heat emanated

from the stator windings.

7. A generator constructed as defined in claim 1, wherein the stator windings concentrated-wound or shunt-wound around a field pole corresponding to any pole of the rotor are shunt from series connections into parallel connections as an rpm of the rotor increases, thus regulating a generated voltage.

8. A generator constructed as defined in claim 1, wherein an electric power produced in the low power windings is supplied to an automotive electric system while an electric power produced in the high power windings is fed to auxiliaries.

9. A generator constructed as defined in claim 1, wherein the produced power is regulated by on-off operations of switches installed in lines connecting the stator windings with the terminals.

10. A generator constructed as defined in claim 1, wherein the rotor comprises a permanent-magnet member composed of permanent-magnet pieces arranged spaced from each other around the rotor shaft, and resinous adhesives bonding together any adjacent permanent-magnet pieces, and a reinforcing member of non-magnetic property surrounding around the permanent-magnet member, the reinforcing member being coated at the inside surface thereof with adhesives.

11. A generator constructed as defined in claim 10, wherein a permeable member is disposed between the rotor shaft and the permanent-magnet member.

12. A generator with diverse power-generation characteristics, comprising a rotor supported for rotation in a stator frame and having mounted with permanent magnets of multiple poles, and a stator arranged around the rotor and fixed to the stator frame, wherein the stator is composed of a stator core having teeth arranged spaced circumferentially to form sequential slots and confronting an outer periphery of the rotor to define an air gap between them, and more than one windings wound spanning across the slots, the windings being each grouped into three winding sets that are divided circumferentially with a slot span on the stator core, the windings belonging to each winding set being wound displaced in slot circumferentially 120 electrical degrees apart to form a three-phase system of windings, and wherein terminals are distributed uniformly over an inside circumference of the stator such that the windings in a 2nd winding set are arranged in the stator slots so as to overlap with a 1st winding set in waveform of emf, while a 3rd winding set overlaps with the 1st set and the 2nd set in waveform of emf, and a controller unit changes over

Sub a3 cmcd

connections of the terminals every winding sets, thus giving any electric power varied in voltage.

13. A generator constructed as defined in claim 12, wherein the winding are grouped into any of three and four winding sets, which are laid in the slots displaced circumferentially of the inside cylinder.

14. A generator constructed as defined in claim 13, wherein a-c power produced in the windings in the winding sets is rectified at a rectifier circuit, and the resultant rectified power is adjusted by a chopper circuit to a preselected voltage.

15. A generator constructed as defined in claim 12, wherein the winding sets are each constructed in mutually independent electric power source where the produced power may be used either remained a-c form or converted to d-c form.

Sub a4

16. A generator constructed as defined in claim 12, wherein terminals of the windings in the winding sets are selectively connected in series and/or parallel by the controller unit, whereby a low tension induced in the windings of the winding sets is consumed in automotive electric systems, whereas a high tension is consumed to energize the heaters incorporated in diesel particulate filters and so on equipped on automotive vehicles and/or to drive the auxiliaries mounted on the

vehicles.

17. A generator constructed as defined in claim 12, wherein the windings for high tension are divided into three winding sets and shunt-wound, the terminals of the windings are selectively connected in series and/or parallel by the controller unit, and the windings for low tension are concentrated-wound to produce the low tension needed to operate the automotive electric system of 24V and so on.

18. A generator constructed as defined in claim 15, wherein the controller unit connects all the concentrated-wound winding sets in series to ensure the maximum high tension, connects any of the concentrated-wound windings in series to ensure any tension less than the maximum high tension and further connects all the concentrated-wound windings in parallel to produce the minimum tension.

19. A generator constructed as defined in claim 12, wherein the controller unit controls an inverter to convert direct to alternating form to drive a motor by the electric power produced in the windings in the winding sets.

20. A generator constructed as defined in claim 12, wherein the winding sets are such arranged that working windings come in symmetry on generation.

21. A generator constructed as defined in claim 12, wherein the windings in the winding sets are connected to form either a wye-connection or a delta-connection to provide a three-phase system of windings, and ends of the wye-connected or delta-connected windings are connected in series to the terminals through a relay.